

Mild traumatic brain injury, not so mild after all

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Douglas Smith, MD, director of the Center for Brain Injury and Repair and professor of Neurosurgery at the University of Pennsylvania School of Medicine, will present information on the molecular mechanism at play in mild TBI (mTBI), commonly called concussions. Although mTBI affects over 1 million people each year in the United States, it is generally ignored as a major health issue. However, this 'mild' form of injury induces persisting neurological and cognitive problems in many of these patients, exacting an enormous emotional and financial toll on society.

Despite the prevalence and impact of mTBI, little is known about how mTBI affect [nerve cells](#) and connections in the brain, and therefore clinical outcomes after injury. Smith and colleagues have begun to amass data from human and animal studies on mTBI at 2-4 days after injury using advanced neuroimaging techniques. They have found distinct changes throughout the white matter in the brain. Also, protein markers of brain pathology were identified after mTBI in the blood of mTBI patients.

The team proposes a potential [molecular mechanism](#) to explain their findings. Specifically, they found that the stretching and disconnecting of nerve-cell [axons](#) after mTBI induces problems to the sodium channels found on the surface of neurons.

"This is not inconsequential," say Smith. "Indeed, the observation that brain pathology can be detected after a concussion calls for much more

extensive efforts to prevent, diagnose, and treat mild [traumatic brain injury](#)."

Provided by University of Pennsylvania School of Medicine

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